CLAIMS

1. A rotary barrier face seal for sealing a process fluid at a space between a housing and a rotatable shaft comprising:

a stationary ring unit coaxially surrounding said rotatable shaft within said housing and arranged for movement axially of said rotatable shaft under a resilient pressure;

a rotary ring unit coaxially surrounding said rotatable shaft within said housing and prevented from axial movement relative to said rotatable shaft when in operation position;

each of said ring units having an end face for mutual engagement under said resilient pressure to form a sealing interface;

one of said ring units being mounted for rotation with said rotatable shaft;

one of said end faces comprising plurality of helical grooves, said plurality of helical grooves extending inward the innermost extent of said plurality of helical grooves defining an inner groove diameter said inner groove diameter being larger than the diameter of the innermost extent of either of said end faces;

at least one of said ring units having at least one supply bore having a supply opening communicating with said sealing interface;

said supply opening positioned at a fluid supply diameter concentric with said rotatable shaft, said fluid supply diameter being larger than said groove diameter; and

buffer fluid supply means communicating with said at least one supply bore to supply a buffer fluid to the sealing interface.

2. A rotary barrier face seal according to claim 1 wherein the outermost extent of said plurality of helical

grooves coincides with the outermost extent of that said end face which includes said plurality of helical grooves.

3. A rotary barrier face seal according to clam 1 wherein the outermost extent of said plurality of helical grooves defines an outer groove diameter, said outer groove diameter being smaller than the diameter of the outermost extent of either of said end faces.

4. A rotary barrier face seal according to claim 1 wherein one of said end faces comprises at least one crescent-shaped pocket communicating with said at least one supply bore.

5. A rotary barrier face seal according to claim 2 wherein one of said end faces comprises at least one crescent-shaped pocket communicating with said at least one supply bore.

6. A rotary barrier face seal according to claim 3 wherein one of said end faces comprises at least one crescent-shaped pocket communicating with said at least one supply bore.

7. A rotary barrier face seal according to claim 1 wherein one of said end faces comprises a circumferential groove, communicating with said at least one supply bore.

8. A rotary barrier face seal according to claim 2 wherein one of said end faces comprises a circumferential groove, communicating with said at least one supply bore.

9. A rotary barrier face seal according to claim 3 wherein one of said end faces comprises a circumferential groove, communicating with said at least one supply bore.